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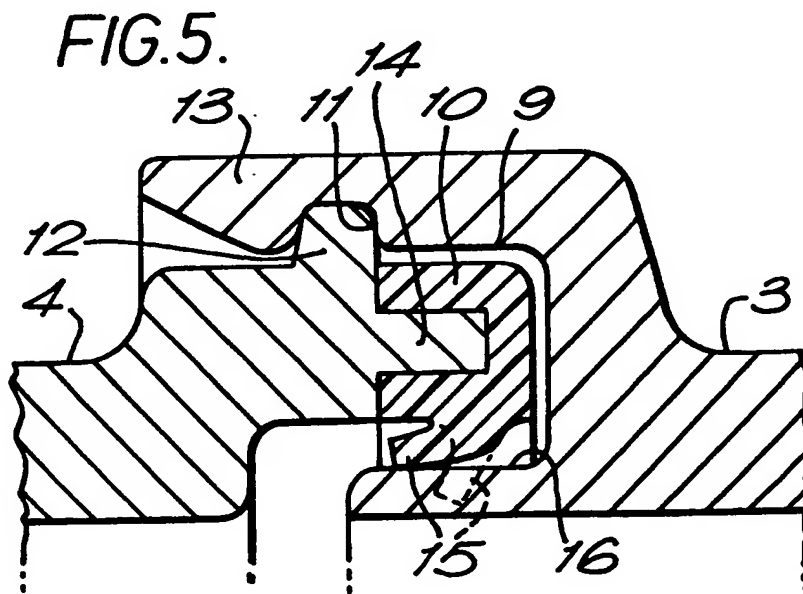
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(54) Swivel pipe connections

(57) A pipe connection comprises a first pipe end portion 3 and a second pipe end portion 4 snap-fitted together such that the pipe parts are relatively rotatable. The first end portion is provided with an annular groove 9 and the second end portion is provided with an annular sealing member 10 in sealing engagement with a surface of the groove. A pipe section provided with such a first end portion and opposed thereto such a second end portion, the central axis of which is inclined with respect to the central axis of the first end portion, is connectable to like sections to form an adjustable bend or between other pipe parts to provide an adjustable pipe fitting.



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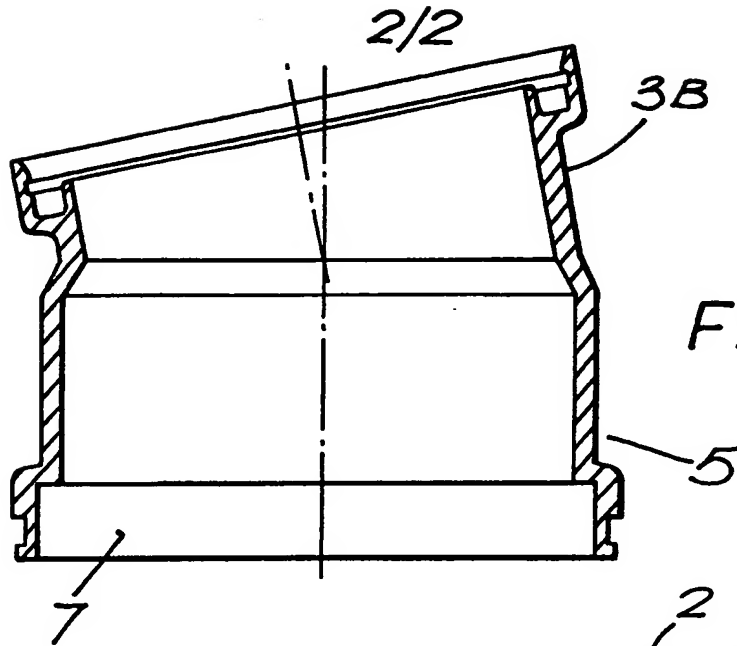


FIG. 3.

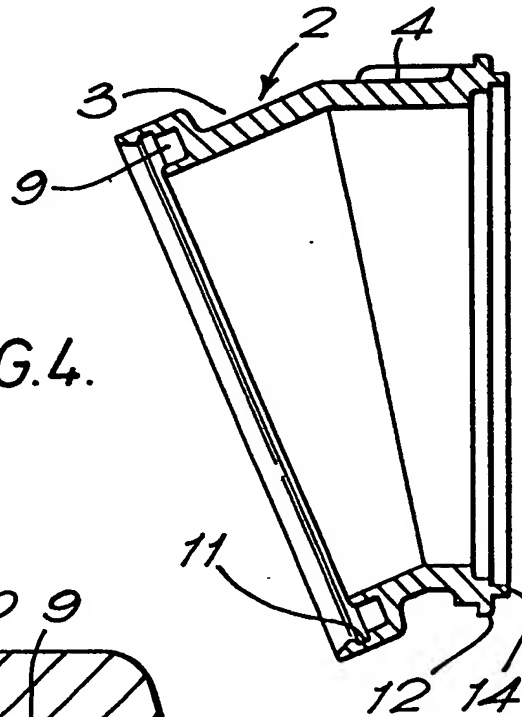


FIG. 4.

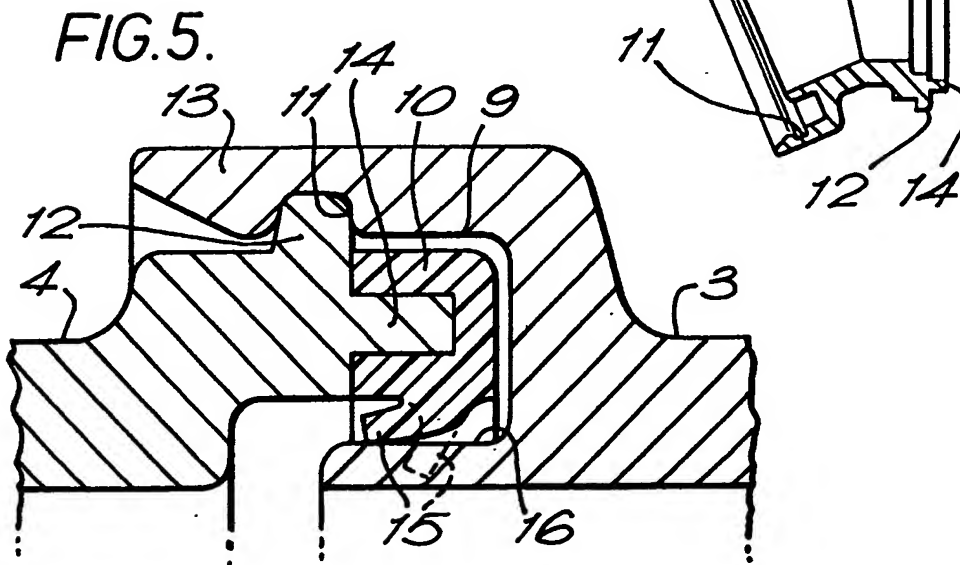


FIG. 5.

SPECIFICATION

Pipe connections

- 5 This invention relates to pipe connections, pipe fittings incorporating pipe connections and pipe parts for connection by pipe connections.

10 An object of this invention is to enable a pipe connection to be made which allows the pipe parts connected thereby to be rotated relative to each other.

15 The invention includes a pipe connection comprising two pipe parts having first and second end portions respectively which are snap-fitted together such that said pipe parts are relatively rotatable, the first end portion being provided with an annular groove and the second end portion being provided with an annular sealing member in sealing engagement with a surface of the groove of the first end portion.

20 The invention also includes an adjustable pipe fitting comprising a plurality of pipe parts disposed end-to-end with respective adjacent pipe parts being connected by a pipe connection.

25 In such an adjustable fitting an intermediate pipe part thereof may comprise a pipe section provided with a said first end portion and opposed thereto a said second end portion and preferably the central axes of the opposed first and second end portions of the pipe section are inclined with respect to each other.

30 The invention also includes a pipe section connectable with like sections for forming therewith an adjustable pipe bend, said section having first and second opposed end portions whose central axes are inclined with respect to each other, the first end portions being adapted to be snap fitted to the second end portion of a like pipe section and the second end portion being adapted to be snap fitted to the first end portion of a further like pipe section such that said like sections are independently rotatable relative to said section, the first end portion being provided with an annular groove and the second end portion being provided with an annular sealing member for sealing engagement with a surface of the groove of the first end portion of a like section when said second end portion of said section is snap fitted thereto in use.

35 The annular groove of said first end portion may be axially outwardly opening.

40 Preferably one of said end portions is provided with a radially opening annular recess and the other of said end portions is provided with a radially extending annular projection which is snap fittable into the recess of said end portion of a like pipe section to connect said sections such that they may be rotated relative to each other.

45 In an embodiment of the invention described in more detail hereinafter, said one end portion

tion is the first end portion and additionally the recess is provided in a radially outer wall of said groove and opens radially inwardly.

50 The sealing member may be mounted on an axially extending projection of said second end portion, and the sealing member advantageously includes a sealing flange which engages the radially inner wall of the groove of the first end portion of a like section when the second end portion of said section is snap fitted to the first end portion of said like section in use.

55 The invention also includes a plurality of pipe sections as set forth above disposed end-to-end with adjacent first and second end portions of respective adjacent sections being snap fitted together.

60 Preferably the outer end portions of the end sections of said bend are snap fitted to respective end fittings each of which includes a socket or spigot at its free end.

65 In order that the invention may be well understood, the embodiment thereof referred to above will now be described by way of example with reference to the accompanying drawings, in which:

70 Figure 1 is a side view of an adjustable pipe bend;

75 Figures 2 and 3 are axial cross-sections of end fittings of the pipe bend;

80 Figure 4 is an axial cross-section of a pipe section of the bend; and

85 Figure 5 is an axial section through a joint between two adjacent pipe sections of the bend.

90 The pipe bend 1 shown in Figure 1 includes a plurality of like pipe sections 2, one of which is shown in Figure 4, connected end-to-end with adjacent first and second end portions 3,4 of respective adjacent sections 2 being snap-fitted together. The opposed end sections 3,4 of each section are integral with each other with their central axes inclined with respect to each other, furthermore the inter-connection of the sections 2 is such as to allow the sections 2 to be rotated relative to each other so that the bend may take up various configurations. The bend also includes two end fittings 5,6 which are snapfitted to the outer end portions of the end sections 2 of the bend. That is the end portions indicated by references 3A and 4A in Figure 1. These end fittings 5 and 6 are shown in more detail in figures 3 and 4 respectively and each includes a pipe coupling part at its free end. End fitting 5 has an end portion 4B, which is identical to the end portion 4 of each section 2 and which is snapfitted to the end portion 3A of the adjacent section, and a free end portion formed with a socket 7. End fitting 6 has an end portion 3B, which is identical to the end portion 3 of each section 2 and which is snap-fitted to the end portion 4A of the adjacent section 2, and a free end portion formed with a spigot 8. As illustrated the cen-

tral axes of the free end portions of the end fittings may be inclined with respect to the other end portions thereof. Preferably the end fittings are connected to the adjacent sections 2 to be rotatable relative thereto to allow for further adjustment of the configuration of the bend. It is to be understood that as alternatives to the illustrated arrangement both end fittings could have either spigots or sockets at their free ends or end fitting 5 could be provided with a spigot and end fitting 6 with a socket.

It will be appreciated from the foregoing that by rotating the sections 2 relative to each other (and by relative rotation of the end fittings if these are also rotatable as in the embodiment) the configuration of the bend 1 can be adjusted to enable it to be connected between pipe lengths of different angular orientations. It will be appreciated that any number of sections 2 may be provided in a bend and the use of three sections 2 in the embodiment although preferred is only an example.

The connection between adjacent sections 2 will now be described with particular reference to figures 4 and 5, it being understood that in the embodiment identical connections are also used to connect the end fittings 5 and 6 to the sections 2 adjacent thereto. The first end portion 3 of each section 2 is provided with an annular groove 9 and the second end portion 4 of each section 2 is provided with an annular sealing member 10 (Figure 5 only). When the second end portion 4 of one section is snap-fitted to the first end portions 3 of an adjacent section 2, the sealing member 10 of the former seals against a surface of the groove 9 of the latter.

To effect the snap-fit connection between the adjacent end portions 3 and 4 of two sections, one of the end portions is provided with a radially opening annular recess 11 and the other end portion is provided with a radially extending annular projection 12 which is snap-fittable into that recess to connect the sections such that they are secured against relative axial movement but can be rotated relative to each other.

In the illustrated embodiment (see particularly Figure 5) the groove 9 of the first end portion 3 is axially outwardly opening and the recess 11 is provided in a radially outer wall 13 of the groove and opens radially inwardly. Thus, the projection 12 is provided on the second end portion 4 and extends radially outwardly.

The sealing member 10 is mounted with an interference fit on, or otherwise secured to, an axially extending projection 14 of the second end portion 4 and includes a sealing flange 15 which in the embodiment is arranged to sealingly engage the radially inner wall 16 of the groove 9, of the first end portion 3 to which the second end portion is snap-fitted. The flange 15 is shown in Figure 5 in its

deformed condition in sealing engagement with the wall 16 of the groove in full line and in its undeformed condition prior to engagement with the wall 16 in dotted line.

70 It is to be understood that the particular snap-fit arrangement illustrated in Figure 5 may be modified, for example by providing the recess 11 as a radially outwardly opening recess in the radially inner wall of the groove and forming the projection 12 so that it extends radially inwardly for engagement with the recess.

Also whilst the sealing member 10 is shown mounted on the second end portion by means of a projection 12 it could instead be mounted on this end portion in a recess provided in the end portion.

Whilst the described embodiment is an adjustable pipe bend it is to be understood that other adjustable pipe fittings may be provided utilising the pipe connection shown in figure 5 and/or the pipe section shown in Figure 4. Thus an adjustable pipe fitting may be provided which comprises two pipe parts connected by respective pipe connections as shown in Figure 5 to a pipe section, such as that illustrated in Figure 4 intermediate the pipe parts.

One particular arrangement envisaged comprises a first pipe part which extends from, and is preferably integral with, a side wall of a manhole connected via a pipe section as shown in figure 4 to an end fitting as shown in figure 2 or figure;

CLAIMS

1. A pipe connection comprising two pipe parts having first and second end portions respectively which are snapfitted together such that said pipe parts are relatively rotatable, the first end portion being provided with an annular groove and the second end portion being provided with an annular sealing member in sealing engagement with a surface of the groove of the first end portion.

2. A pipe connection as claimed in claim 1, wherein said annular groove of said first end portion is axially outwardly opening.

3. A pipe connection as claimed in claim 1 or 2, wherein one of said end portions is provided with a radially opening annular recess and the other of said end portions is provided with a radially extending annular projection which is snap-fitted into the recess of said one end portion to connect said pipe parts such that one may be rotated relative to the other.

4. A pipe connection as claimed in claim 3, wherein said one end portion is said first end portion.

5. A pipe connection as claimed in claim 4, wherein said recess is provided in a radially outer wall of said groove and opens radially inwardly.

6. A pipe connection as claimed in any one

of the preceding claims, wherein said sealing member is mounted on an axially extending projection of said second end portion.

7. A pipe connection as claimed in any one of the preceding claims, wherein said sealing member includes a sealing flange which engages the radially inner wall of the groove of the first end portion.

8. An adjustable pipe fitting comprising a plurality of pipe parts disposed end-to-end with respective adjacent pipe parts being connected by a pipe connection as claimed in any one of the preceding claims.

9. An adjustable pipe fitting as claimed in claim 8, wherein an intermediate pipe part thereof comprises a pipe section provided with a said first end portion and opposed thereto a said second end portion.

10. An adjustable pipe fitting as claimed in claim 9, wherein the central axes of the opposed first and second end portions of the pipe section are inclined with respect to each other.

11. A pipe section connectable with like sections for forming therewith an adjustable pipe bend, said section having first and second opposed end portions whose central axes are inclined with respect to each other, the first end portion being adapted to be snap-fitted to the second end portion of a like pipe section and the second end portion being adapted to be snap-fitted to the first end portion of a further like pipe section such that said like sections are independently rotatable relative to said section, the first end portion being provided with an annular groove and the second end portion being provided with an annular sealing member for sealing engagement with a surface of the groove of the first end portion of a like section when said second end portion of said section is snap-fitted thereto in use.

12. A pipe section as claimed in claim 11, wherein said annular groove of said first end portions is axially outwardly opening.

13. A pipe section as claimed in claim 11 or 12, wherein one of said end portions is provided with a radially opening annular recess and the other of said end portions is provided with a radially extending annular projection which is snap-fittable into the recess of said one end portion of a like pipe section to connect said sections such that one may be rotated relative to the other.

14. A pipe section as claimed in claim 13, wherein said one end portion is said first end portion.

15. A pipe section as claimed in claim 14, wherein said recess is provided in a radially outer wall of said groove and opens radially inwardly.

16. A pipe section as claimed in any one of the preceding claims, wherein said sealing member is mounted on an axially extending projection of said second end portion.

17. A pipe section as claimed in any one of claims 11 to 16, wherein said sealing member includes a sealing flange which engages the radially inner wall of the groove of the first end portion of a like section when the second end portion of said section is snap-fitted to the first end portion of said like section in use.

18. An adjustable pipe bend comprising a plurality of pipe sections as claimed in any one of claims 11 to 17 disposed end-to-end with adjacent first and second end portions of respective adjacent sections being snap-fitted together.

19. An adjustable bend as claimed in claim 18, wherein the outer end portions of the end sections of said bend are snap-fitted to respective end fittings each of which includes a socket or spigot at its free end.

20. A pipe joint substantially as herein described with reference to Figure 5 of the accompanying drawings.

21. A pipe section connectable with like sections for forming therewith an adjustable pipe bend, and substantially as herein described with reference to Figure 1 of the accompanying drawings.

22. An adjustable pipe bend substantially as herein described with reference to the accompanying drawings.

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